Notes - Probability & Compound Events

I draw two cards from a standard deck.

Ex 1: Find $P(\overset{\text{both red}}{2 \text{ red}})$

Method 1

$$\frac{26}{52} \cdot \frac{25}{51} = \frac{650}{2652}$$

$$= \frac{25}{102}$$

Method 2

$$\frac{{}_{26}C_2}{{}_{52}C_2} = \frac{325}{1326} = \frac{25}{102}$$

Ex 2: $P(\text{both red} \overset{+}{\text{or}} \text{both less than 5})$ * Aces are high

2,3,4 2,3,4
2,3,4 2,3,4

+ Inclusive

Method 1

From Ex 1

$$\frac{650}{2652} + \frac{12}{52} \cdot \frac{11}{51} - \frac{6}{52} \cdot \frac{5}{51}$$

$$\frac{650 + 132 - 30}{2652} = \frac{752}{2652}$$

$$= \boxed{\frac{188}{663}}$$

$$\frac{{}_{26}C_2}{{}_{52}C_2} + \frac{{}_{12}C_2}{{}_{52}C_2} - \frac{{}_{6}C_2}{{}_{52}C_2}$$

$$\frac{325 + 66 - 15}{1326} = \frac{376}{1326}$$

$$= \boxed{\frac{188}{663}}$$